IONIC BONDING

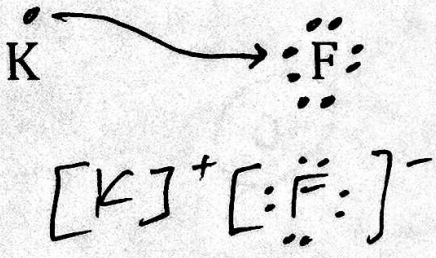
t 1: Complete the chart for each element.

Element	# of protons	# of electrons	# valence electrons	Oxidation Number (Charge)	Metal or Nonmetal?
Potassium (K)	19	19	1	1+	M
Fluorine (F)	9	9	7	1-	Nonmetal
Magnesium (Mg)	12	12	2	2+	Metal
Iodine (I)	53	53	7	1-	NM
Sodium (Na)	11	11	1	1+	M
Oxygen	8	8	6	2-	NM
Chlorine (Cl)	17	17	7	1-	NM
Calcium (Ca)	20	20	2	2+	M
Aluminum (Al)	13	13	3	3+	Metal

art 2: For each of the following, draw the Lewis structures, arrows to show movement of electrons, the orrect criss-cross diagram, and the final chemical formula.

1. **Potassium + Fluorine**

Lewis Structures



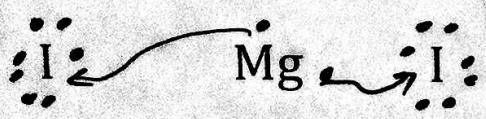
Criss-cross Method

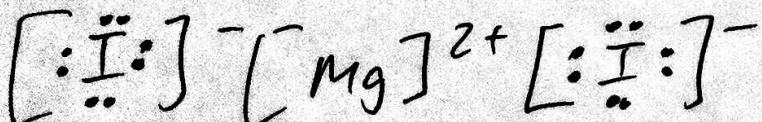
Formula

KF

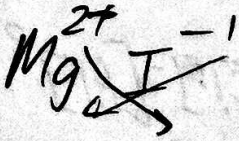
2. **Magnesium + Iodine**

Lewis Structures





Criss-cross Method

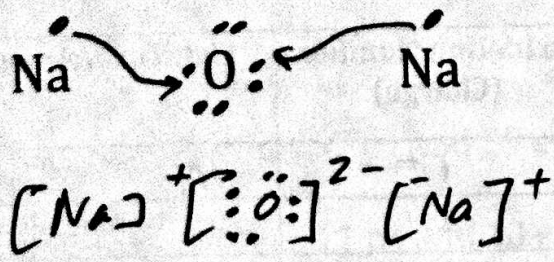


Formula

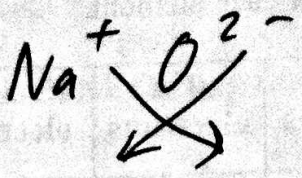
MgI_2

3. Sodium + Oxygen

Lewis Structures



Criss-cross Method

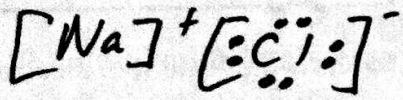


Formula

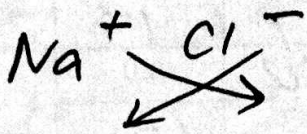
Na_2O

4. Sodium + Chlorine

Lewis Structures



Criss-cross Method

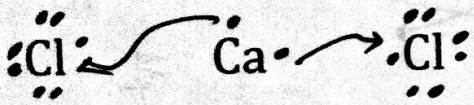


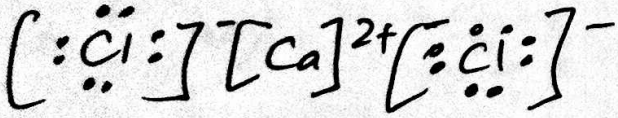
Formula

$NaCl$

5. Calcium + Chlorine

Lewis Structures





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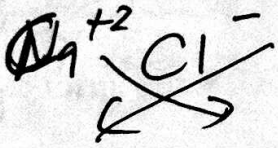
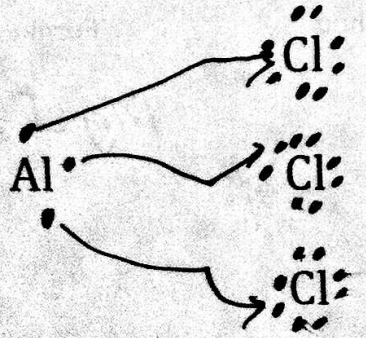


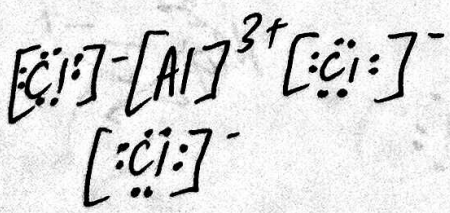
Formula

$CaCl_2$

6. Aluminum + Chlorine

Lewis Structures





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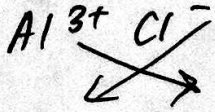
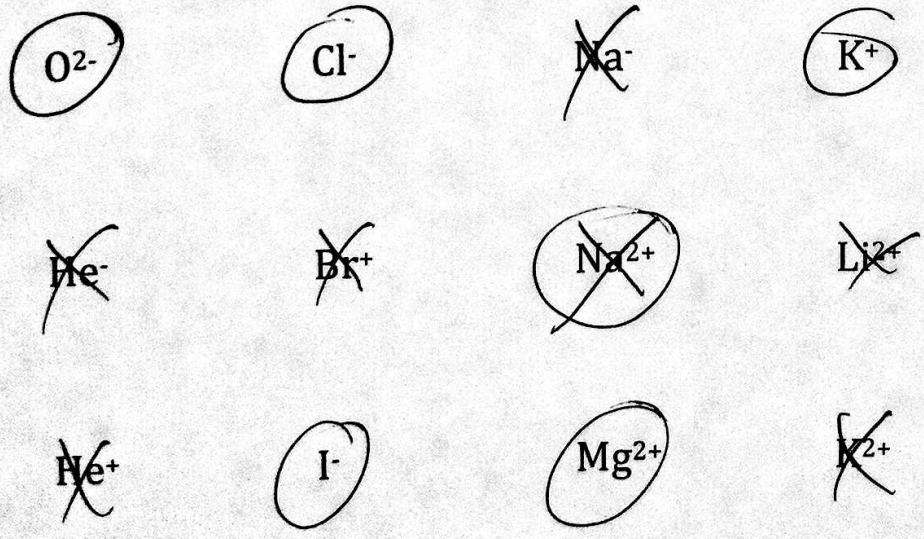


Formula

$AlCl_3$

Practice with Ions:

1. The charge of one proton is +1.
2. The charge of on electron is -1.
3. An atom that has 2 p+ and 3 e- has an overall NET charge of -1.
4. An atom that has 57 p+ and 59 e- has an overall net charge of -2.
5. An atom that has 11 p+ and 10 e- has an overall net charge of +1.
6. An atom that has 7 p+ and 10 e- has an overall net charge of -3.
7. Why do halogens want to form -1 ions? (Hint: think about how many valence electrons they have) THEY HAVE 7 VALANCE e- AND WANT 8 e- TO OBTAIN A FULL OUTER SHELL TO DO SO THEY GAIN 1 NEGATIVE CHARGE
8. Why do alkali metals want to form 1+ ions? (Hint: think about how many valence electrons they have) THEY HAVE 1 VALANCE e- AND TO BECOME LIKE THEIR NEAREST NOBLE GAS IT IS EASIEST TO GIVE 1 e- AWAY SO BY LOOSING 1 e- IT HAS A +1 CHARGE
9. Circle the ions that are most likely to form. Put an "X" through any ions that will NOT form.



Fill in the table below:

Elements	Charge of Each	Formula
Ca, Br	Ca^{2+}, Br^{-}	$CaBr_2$
Li, O	Li^{+} O^{2-}	Li_2O
K, I	K^{+} I^{-}	KI
O, Ca	O^{2-} Ca^{2+}	CaO
Cl, Na	Cl^{-} Na^{+}	$NaCl$
Cs, S	Cs^{+} S^{2-}	Cs_2S
O, Al	O^{2-} Al^{3+}	Al_2O_3
Ba, N	Ba^{2+} N^{3-}	Ba_3N_2
P, Sr	P^{3-} Sr^{2+}	Sr_3P_2
S, Mg	S^{2-} Mg^{2+}	MgS

Fill in the table below:
***Note that in the second column, the element symbols are there to assist you, but they do NOT include the charges. You must write in the appropriate charges as superscripts and then write the formula.

Name	Charge of Each	Formula
Francium Fluoride	Fr^{+}, F^{-}	FrF
Rubidium Oxide	Rb^{+1}, O^{2-}	Rb_2O
Magnesium Chloride	Mg^{+2}, Cl^{-}	$MgCl_2$
Aluminum Sulfide	Al^{+3}, S^{2-}	Al_2S_3
Strontium Selenide	Sr^{2+}, Se^{2-}	SrSe
Barium Fluoride	Ba^{2+}, F^{-}	BaF_2
Magnesium Iodide	Mg^{2+}, I^{-}	MgI_2
Potassium Chloride	K^{+}, Cl^{-}	KCl
Aluminum Nitride	Al^{3+}, N^{3-}	AlN

Elements	Charge of Each	Formula
Ca, Br	Ca^{2+}, Br^{-}	$CaBr_2$
Li, O	Li^{+} O^{2-}	Li_2O
K, I	K^{+} I^{-}	KI
O, Ca	O^{2-} Ca^{2+}	CaO
Cl, Na	Cl^{-} Na^{+}	$NaCl$
Cs, S	Cs^{+} S^{2-}	Cs_2S
O, Al	Al^{3+} O^{2-}	Al_2O_3
Ba, N	Ba^{2+} N^{3-}	Ba_3N_2
P, Sr	P^{3-} Sr^{2+}	Sr_3P_2
S, Mg	S^{2-} Mg^{2+}	MgS

Fill in the table below

Name	Charge of Each	Formula
Francium Fluoride	Fr^{+}, F^{-}	FrF
Rubidium Oxide	Rb^{+} O^{2-}	Rb_2O
Magnesium Chloride	Mg^{2+} Cl^{-}	$MgCl_2$
Aluminum Sulfide	Al^{3+} S^{2-}	Al_2S_3
Strontium Selenide	Sr^{2+} Se^{2-}	$SrSe$

Fill in the table below

Formula	Charge of Each
Cu_3N_2	Cu^{2+}, N^{3-}
$CoCl$	Co^{+1} Cl^{-1}
Fe_2O	Fe^{+1} O^{2-}
Cs_3N	Cs^{+} N^{3-}
CaS	Ca^{2+} S^{2-}
Zn_3P_2	Zn^{2+} P^{3-}
Al_2S_3	Al^{3+} S^{2-}
$BaCl_2$	Ba^{2+} Cl^{-}